ALKALI ACTIVATION OF FLY ASHES, PART I: MECHANICAL PRE-PROCESSING FOR THE IMPROVEMENT OF THE FLY ASH REACTIVITY

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Fly ashes use to be heterogeneous materials as a function of the mineral origin of the coal burned in the power plant. The control of particle size distribution of fly ashes by a pre-mechanical treatment can improve the reactivity of some fly ashes and help to produce homogeneous materials for the fabrication of alkaline cements. In this paper original and pre-mechanical activated fly ashes (from different countries) were studied. The alkali activator used in all cases was an 8-M NaOH solution. The reaction rate was determined through conduction calorimetry. Paste mechanical strength was determined on 1x1x6-cm prismatic specimens. Both the starting ash and the reaction products were characterised by means of XRD and SEM/EDX. The results obtained show that effectively the pre-mechanical activation can help to obtain a good quality fly ash independent on the mineral origin of coal.